Errata in AIPG 2007-2009 papers

Dear readers,
It is our constant endeavor to provide quality and standard answers to our readers. However, despite our best efforts, some errors have crept up in the current volume especially in the AIPG 2007 paper. The error on our part was purely unintentional, and since we take such errors very seriously, we regret the inconvenience caused. We are listing the errors and the corrections as below.
We have also noted that a lot of students are under the influence of unnecessary and harmful speculation regarding a lot of answers which have been solved correctly by us. Please note that the errors highlighted below are the only errors we could come across after a thorough re-evaluation of all the three papers. All other questions are correct to our best knowledge. Please feel free to contact us on mail for any other doubt, and although constructive criticism is always welcome, we urge the readers not to fall for unnecessary speculation.
We will continue to strive for excellence in our future efforts as would be evident in our forthcoming AIPG 2010 paper which is under review and will be launched soon.
Thanks and regards,
Dr Neeraj Wadhawan
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AIPG 2009

A78 : Answer is option 'A' i.e. "increase in cationic form".

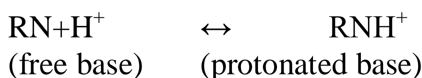
The explanation given by us largely correct except the first para which is appended and corrected and given below. The rest of explanation is perfectly valid and correct.

Theory of LA blockade

LA are alkaloid bases that are combined with acids usually hydrochloric, to form water soluble salts. All anaesthetic salts are formed by a combination of a weak base & a strong acid.

- The salts are used because they are stable & water soluble; water solubility is necessary for their diffusion through interstitial fluids to the nerve fibres.

- **In solution** the salts of LAs exist in both free base form & as protonated charged molecules. The relative properties of each are decided by pKa of the salt.



$RN + H^+ \leftrightarrow RNH^+$
(free base) (protonated base)

- When injected, the relative proportions of each molecule species depends on Pka of salt & the tissue pH.

- ***When the tissue pH is low (as in inflammations, infections) the protonated cationic form increases while the free base form decreases.***

- Since it is the free base form that penetrates across the nerve membrane, the increase in the cationic form limits the diffusion of LA across the nerve membrane→ lesser nerve blockade.

- ***This is the basis of LA being less effective in presence of pus/infection.***

A123: Answer is option 'B' i.e. "increases surface free energy of dentin". ***Ref. Read below***

Primer reestablishes the surface free energy to levels compatible with a more hydrophobic restorative material……… The first coat of primer applied on etched dentin works as a primer – it increases the surface free energy of dentin…… Second coat fills the spaces between the dense networks of collagen fibers
-------Sturdevant 4th /241.

The primer only has to forge the link from the hydrophilic dentine base to the hydrophobic resin with the help of amphiphilic molecules…….. The light-bodied primer is optimized in terms of penetration while the bonding resin is designed as a connection mediator which can be subjected to mechanical loading after polymerization.
--------Adhesive technology, theoretical and practical guidelines by 3M ESPE

Dentin is hydrophilic by virtue of its water content while the bonding agent is hydrophobic. When both are brought in contact, there is little or no wetting of the dentin due to an increase in the contact angle. Primer is an amphiphillic molecule that exhibits hydrophilic nature at its one end and hydrophobic nature on the other end. It is volatile also and thus when it evaporates from dentin surface, it takes excess water along (from dentin surface) and thus increases the surface energy of the dentinal surface. The hydrophilic part of the primer interacts with the hydrophilic dentin and the hydrophobic end remains free, aligned outwards to interact with the hydrophobic resin (bonding agent). Thus it lies between collagen (dentin) and resin (bonding agent).

This makes both option 'B' and 'C' correct. So choosing one becomes difficult. But only recently we came to know that this question and a few of the other cons and endo questions were taken from a question bank of The University of Birmingham where the answer is given as " It increases the surface free energy of the dentin." Hence we go with this option as the answer.

A125: Answer is option C i.e. "3mm".

Although what we previously explained that the ideal depth of a temporary cement should be 4mm and minimum is 3mm is absolutely valid but the question is straight lifted from E-Course series of University of Birmingham where the answer is given as 3mm without any reference or explanation. Hence it is better to follow this answer.

AIPG 2007

Q79) Tg of impression compound is:

a) 39°C
b) 43.5°C
c) 65°C
d) 100°C

A79) Answer is A i.e. 39^{0}C. *Ref: Essentials of dental materials by Soratur 1st/ 110*

"39°C is the glass transition temperature of impression compound."

Temp	Condition
55-70 ^{0}C	Softening temperature
45^{0}C	Safe temperature at which it can be inserted in mouth
43.5^{0}C	Temp at which crystalline fatty acids begin to solidify
39^{0}C	Glass transition temperature
37^{0}C	Mouth temp at which impression compound is removed from mouth

Q86) There was a printing mistake in question. The question should be read as:
Which of the following is **not** a mucostatic impression material:

a) Agar
b) Alginate
c) ZOE paste
d) Impression compound

A86) Answer remains option D i.e. "Impression compound"

Ref: McCabe's / 118-119.

Impression compound is a mucocompressive impression material. Alginate, agar and ZOE paste are all mucostatic impression materials. In fact agar is one of the best mucostatic materials with a high surface reproduction.

Mucostatic impression materials (in decreasing order):
Impression plaster> ZOE paste>agar/light body silicone>alginate

Q94) Which of the following component acts as accelerator in ZOE impression paste:
a) Zinc sulphate and Zinc chloride
b) Zinc chloride and eugenol
c) Zinc oxide and eugenol
d) Zinc hydroxide and zinc oxide

A94) Answer is A i.e. "Zinc sulphate and Zinc Chloride." *Ref: still searching*
Despite intensive searches, we could not find anywhere that $ZnSO_4$ or $ZnCl_2$ are use as accelerators in ZOE paste. The accelerators commonly used are:
"Zinc stearate, 2% (acts as accelerator), Zinc acetate, 0.7% (improves strength)"- *Wikipedia*
"Accelerators can be calcium chloride, magnesium chloride, zinc acetate or magnesium acetate or acetic acid."- *Soratur 1st/111*
Other accelerators can be zinc acetate dihydrate, primary alcohols and glacial acetic acid. High atmospheric temperature and humidity also accelerates the reaction. Cooling the glass slab and spatula also accelerates setting.
Hence it is obvious that none of the options given are correct. But out of the options given, option A seems to be the single best answer.

Q98) Rough and irregular surface of elastomeric impression material results from:
a) Improper ratio of polymer to monomer
b) Incorporation of air bubbles during mixing
c) Improper application of pressure during seating of tray
d) Presence of excessive saliva in the impression field

A98) Answer remains option D i.e. Presence of excess saliva in the field.
Ref: Phillips 10th ed/ 174.
We know people are talking of option A i.e. improper ratio of monomer to polymer as the answer. But we must remember that elastomeric materials come as a base paste and a catalyst paste and not as monomer and polymer pastes. Hence, although option D is not exactly the correct answer, but out of the options given, it is the single best answer. We would have preferred to go with option A if it had read: ***"improper ratio or mixing of components"*** *or* ***"improper ratio or mixing of base and catalyst pastes".***

Q106) The highest and sharpest cusp on mandibular primary 1st molar is:
a) Mesiobuccal

b) Distobuccal
c) Mesiolingual
d) Distolingual

A106) Answer is C i.e. "Mesiolingual" *Ref: See below*

The question is a repeat from National Boards.

Remember for deciduous mandibular first molar:

- Largest and longest cusp: MB
- Sharpest cusp: ML
- Highest cusp: both MB &ML

Q112) Which of the following is the least mineralized:

a) Cementoid
b) Cellular cementum
c) Acellular cementum
d) Incremental line

A112) Answer is option 'C' i.e. "Acellular cementum".

This is another of the controversial questions. We still are not convinced by the explanation but we are following this answer as this is the popular choice amongst students both who are preparing and those who have been selected.

Cellular cementum is the cementum which has cementocytes embedded in its matrix while Acellular cementum is devoid of cellular elements. Acellular cementum less calcified than cellular cementum. Cementoid is the surface uncalcified layer of the cementum in areas of intact periodontal tissue. It is also called as precementum and uncalcified cementum.

Yes of course we are still in favor of cementoid as the answer as "cementoid" is least calcified (0%) but the popular choice amongst the candidates is option 'C' i.e. "acellular cementum". They justify it saying that question asked is least calcified cementum which is acellular cementum while cementoid is not calcified at all and thus it is eliminated. Somehow this does not convince us but we decide to follow them as this seems another question lifted from the question banks. (In an exam, 'A' scored '0' marks, 'B' scored '2' and 'C' scored '3' marks. Now who scored less?? Do you think 'B' is the answer as 'A' didn't score anything?!!!!).

Some people/books say that question asked was "which form/type of cementum is least calcified" and thus they justify answer "acellular cementum" saying that "cementoid" is not a type of cementum. Cementoid being deposited by cementoblasts on cementum surface and dictionary quoting it as "uncalcified cementum" makes all such vague explanations insignificant and irrelevant.

Q113) The choices that came were slightly different than what we gave earlier. Read the question as below:

New odontoblasts are differentiated from mesenchymal cells in:

a) 24 hrs
b) 1 week
c) 15 days
d) 1 month

A113) Answer is option C i.e. "15 days" Ref: Sturdevant 4th/

Although latest research indicates that the odontoblasts differentiate within 3 days from mesenchymal cells as given by us in the main text but the language of the question clearly indicates that it has been lifted from Sturdevant where the answer is given as 15 days.

"In about 15 days new odontoblasts are differentiated from mesenchymal cells of the pulp and these replacement odontoblasts lay down the reparative dentin. Reparative dentin is confined to the localized irritated area of the pulp cavity wall becomes apparent microscopically about one month from the inception of the stimulus."---- *Sturdevant 4th/24.*

Q128) Non anatomic teeth are indicated primarily in:

a) Flat ridge
b) Sharp ridge
c) Poor muscular control
d) Well contoured ridge

A128) Answer is option A i.e. "Flat ridge". *Ref. Winkler 2nd/263*

Although options A, B and C are all correct, but out of these option A i.e. flat ridge is the single best indication for the use of non anatomic teeth. Hence it is the answer of choice.

Q135) All of the following are true for non active caries, except:

a) Severe pain on excavation
b) Soft and leathery in consistency
c) Covered by a layer of plaque
d) Brown or black discoloration

A135) Answer is both 'A' & 'B' i.e. "severe pain on excavation and soft and leathery in consistency". *Ref: See below*

Non active carious lesion is hard in consistency and there is little or no pain on excavation as there is adequate time for secondary dentin formation.

Options C&D are definitely true.

'Carious lesion may be classified according to their activity. A progressive lesion is described as an active carious lesion whereas a lesion that may have formed earlier and then stopped is referred to as an arrested or inactive carious lesion. The distinction between active and arrested may not be straight forward. There will be a continuum of changes B/W active and arrested and part of lesion may be active while another part is arrested. This concept is totally logical because the lesion merely reflects the ecological balance in the overlying biofilm.'

------Essential of dental caries by Rudd 3rd ed/8-9

"Clinically actively progressing lesions are soft and wet. Because of the speed of the development of the lesion, the defence reaction will not be well developed. Pain is easily evoked by hot, cold and sweet stimuli, in contrast, arrested or slowly progressing lesions have a hard or leathery consistency. Tubular sclerosis is marked histologically. The most striking remineralization taking place on and within a surface exposed to the oral environment."

-----Essential of dental caries by Rudd 3rd ed/36-37

"Arrested enamel lesion is covered with normal plaque (and not pathogenic) and enamel structure is remineralised and strong."

---------Sturdevant 4th /94 table 3.6.

"An arrested enamel lesion is brown to black, hard and as a result of fluoride, may be more caries resistant than contiguous, unaffected enamel. An arrested dentinal lesion typically is open (allowing debridement from toothbrushing) dark and hard and this dentin is termed sclerotic or eburnated dentin."

---Sturdevant 4th /276

Q153) After how many days following concussion/contusion should the tooth be checked again for pulpal vitality:

a) 3-4 days
b) 10-12 days
c) 1 month
d) 3-6 months

A153) Answer remains 'B' i.e. "10-12 days".

Ref: Pileggi R, Dumsha TC, Myslinksi NR. The reliability of electric pulp test after concussion injury. Endod Dent Traumatol.1996 Feb;12(1):16-9.

"Traumatic injuries to teeth present a difficult diagnostic problem with respect to determining the vitality of the affected teeth. Conventionally, a latency period of 4 to 6

weeks is proposed as the amount of time required for the return of a positive electric pulp test (EPT) response; however, this has been based on empirical data. The purpose of this study was to 1) determine a time frame during which a return of a reliable response to EPT may be measured, and 2) correlate this time frame with pulpal vascular changes that occur after traumatic injuries. In a majority of the cases, a positive response to the EPT returned within 12 days post concussion injury and as early as 10 days." *- Pileggi et al*

Hence the answer is clearly 10-12 days. We know people consider 4-6 weeks as the answer but they must realize that this is an old concept. Now it proposed that pulp vitality should be checked in 10-12 days after concussion injury.

Q169) Which of the following disease is most commonly associated with periodontal disease:

a) AIDS
b) Hypophosphatasia
c) Wegners granulomatosis
d) Multiple myeloma

A169) Answer is 'A' i.e. "AIDS". *Ref: Carranza 10th ed/ 383, 384, 197, 605.*

Out of the choices given, only multiple myeloma is a disease of hematologic origin. Hence, ideally multiple myeloma should be the answer even though it seldom has periodontal manifestations. But it is obvious that the examiner never paid heed to the fact that AIDS is not a true hematologic disease but a viral disease affecting the immune and hematologic systems. Out of the choices given, only AIDS is commonly associated with periodontal disease and hence is the answer. Although latest research indicates that AIDS may be a predisposing factor and that it cannot be definitely implicated in etiopathogenesis of periodontal disease but still it is well known that AIDS patients do have a higher incidence of periodontal disease. Wegner's granulomatosis is neither a hematologic disease nor does it commonly affect the oral cavity and hence cannot be the answer.

Q174) Sudden appearance of dumbbell swelling after PSA block is due to penetration in:

a) Internal maxillary artery
b) Pterygoid plexus of vein
c) Greater palatine artery
d) Sphenopalatine artery

A174) **Answer remains option 'B' i.e. "Pterygoid plexus of veins."**

Ref: Stedman's 21st/139, Malameds handbook of Local anaesthesia 4th/252

"A.maxillaris, (syn.) maxillary artery; internal maxillary artery."
"A.maxillaris externa, a. facialis." *–Stedmans/139*

Clearly internal maxillary artery is another name for the maxillary artery.
Now for completing the answer:
"Posterior Superior alveolar nerve block: usually produces the largest and the most esthetically unappealing hematoma. The infratemporal fossa, into which the bleeding occurs, can accommodate a large volume of blood. The hematoma is usually not recognized until the swelling appears on the side of face (usually a few minutes after the injection is completed), progresses inferiorly and anteriorly towards the lower anterior region of the cheek. It is difficult to apply pressure to the site of bleeding in this situation because of the location of the involved blood vessels. It is also relatively difficult to apply pressure directly to the posterior superior alveolar artery (the primary source of bleeding) , the facial artery and the pterygoid plexus of veins. They are located posterior, superior and medial to the maxillary tuberosity." - Malameds

Clearly amongst the options provided pterygoid plexus of veins is the single best answer as maxillary artery can never be directly damaged during PSA block until and unless the operator has never opened anatomy book before giving injection and has taken the task of killing the patient upon himself.

Q176) In vasovagal syncope which of the following does not occur:
a) Hypotension & tachycardia
b) Constriction of pupil
c) Vomiting
d) Cold extremities.

A176) Answer is B i.e. "Constriction of pupil."
Ref. Medical emergencies in a dental office by Malamed / 125- 132.
Pupillary dilation is seen in late syncope and not pupillary constriction. Nausea and vomiting can be seen in vasovagal syncope.

Q185) All the following is true except:
a) Use of E speed film reduces radiation exposure
b) Use of rectangular collimator reduces density
c) Use of rectangular collimator reduces radiation exposure
d) Use of collimator reduces size of X ray production

A185) Answer is D i.e. "Use of collimator reduces size of X-ray production."
Ref: Christensen's physics of diagnostic radiology/98
Collimators have nothing to do with the size of X-ray beam *production*. Size of X-ray production is dependent on the size of effective focal spot and the angulation of the focal spot to the electron beam.
Collimators only reduce the scattered photons and thus control size of the projected beam, not the size of produced beam. Density definitely decreases with the use of collimators as the total number of photons affecting the film decrease.

"By decreasing the amount of scatter radiation, collimators also affect the exposure factors. As the x-ray field is decreased, the exposure factors must be increased to maintain a constant film density."- *Christensen's physics of diagnostic radiology/98*

About collimators:

- Three types of X-ray beam restrictors: aperture diaphragms, cones (cylinders) and collimators
- Their basic function is to restrict the size and shape of x-ray beam
- Collimators are best general purpose beam restrictors
- Advantages:
    - Less patient exposure
    - Increased radiographic contrast and thus improved film quality
- Collimators reduce density. Hence exposure time may need to be increased to maintain same density.

Q187) The question had a spelling mistake which is highlighted. Read the question as below:

All of the following factors are considered as safety measures regarding radiation exposure **<u>except</u>:**

a) Ideal position to stand while taking radiographs is an angle of 90-135° & 6 feet away from the patient
b) Lead lining of walls is mandatory
c) Film badges should be checked every month
d) Use of low kVp is recommended

A187) Answer remains option "D" i.e. "Use of Low KvP is recommended".

Ref: White – Pharoah 5th ed/ 56-67.

Q193) Radiographic view for diagnosing horizontally favourable and unfavourable fracture is:

a) OPG
b) PA view skull
c) Lateral oblique view
d) Reverse Towne's projection

A193) Answer remains A i.e. "OPG." *Ref: see below*

We have consulted numerous texts and all books are unanimous in the view that OPG is the single best view to diagnose mandibular fractures. If any of you have better reference please let us know.

"Mandibular fractures are exceptions to the general movement towards CT scans for facial fracture diagnosis. Although a CT scan can essentially diagnose all mandibular fractures, a panoramic radiograph or panorex is the radiologic study of choice. A

panorex is almost equal to a CT scan in sensitivity for fractures of the mandible." -----
Mastery of surgery, Vol 1 by Fischer and Bland/374

"The best initial radiograph is the panorex, accompanied by an open mouth Townes view. Other radiographs that can be used to evaluate mandibular fractures are the posteroanterior (PA) and lateral oblique views."-- *The trauma manual: trauma and acute care surgery by Pietzman, Rhodes, et al /179*

"Equipment for panoral tomography of the mandible has now become standard in all the maxillofacial departments and most patients with mandibular fractures are sufficiently mobile to be placed in the machine. Apparatus has been developed for producing these important diagnostic films in a modified unit which allows the radiograph to be taken with the patient lying down.

Panoral tomograms represent the best single overall view of the mandible and are especially valuable for demonstrating fractures in the condylar region. The combination of a posteroanterior (PA) view and a panoral tomogram obviates the need for further radiographs nand significantly reduces the overall radiation dose to the patient.

In the unlikely event that panoral tomography is unavailable, left and right oblique lateral views in combination with a rotated PA projection can be substituted."----
Fractures of facial skeleton by Peter Banks(2001)/68

"Panographic, posteroanterior and reverse Townes views are very diagnostic and relatively inexpensive radiographs to survey the mandible. The panoramic radiograph is the single most informative radiograph used in the diagnosis of mandibular fractures. In radiology departments without panoramic capabilities, lateral oblique radiographs can serve as a substitute for the lateral view of the mandible."---*Oral and Maxillofacial surgery: Trauma by Fonseca 1st /93*

If all these references are not enough, only god can help.